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ABSTRACT

Evaluation of vocational programs is complicated by the entry of graduates into many occupations other than the ones for which they were trained. To provide a reliable criterion for evaluating programs, the methodology for determining job relatedness both horizontally and vertically is developed, making it possible to compare two jobs or a given job and a training program. (BH)

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THE MEASUREMENT OF JOB RELATEDNESS FOR VOCATIONAL PROGRAM EVALUATION

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Past efforts directed toward vocational program evaluation have typically used as a criterion measure percentage of graduates initially employed. However, as concepts like "accountability" and "relevancy" begin to influence educators' values, more precise measures will be needed. One such measure is the degree to which the training program of an individual is related to his employment situation. This paper considers several of the factors involved in measuring job relatedness and suggests a relatedness framework for program evaluation.

OBJECTIVES AND JOB RELATEDNESS

The importance given to job relatedness measurement depends upon ones' perception of the purpose of the training program. If the primary reason for the training program is to help the student enter the labor force where he may subsequently build the necessary job-required skills, the criterion of employment as the sole or principal measure is appropriate and sufficient. But if vocational education is perceived to have--beyond placement--a responsibility for providing skills and knowledges relevant to a specific occupation or group of occupations, then the evaluation model cannot stop with a measure of percentage of initial employment. The evaluator must look carefully at the degree of congruence between the kinds of competencies taught and those required by the employment situation. Thus, the evaluator needs to be able to specify, for a given training program and given job, the extent of similarity or degree of relatedness.

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THE MEASUREMENT OF JOB RELATEDNESS FOR VOCATIONAL PROGRAM EVALUATION

METHODS OF MEASURING JOB RELATEDNESS

The most straightforward method of measuring job relatedness is to ask the former student whether his present job is related to his training--yes or no. This, of course, yields only dichotomous data where finer measures may be desirable. A more serious problem is that of reliability. Relatedness may mean different things to different people.

A second alternative would have individuals rate the relatedness of their training program to their jobs on several educationally-relevant variables. For instance, questions could be asked concerning the correspondence of equipment used in training to that used on the job, the correspondence of methods for handling problems, the correspondence of manipulative skills, and the like.

Several objections may be raised to this approach. The circumstances relating to the most effective training for a given job may not necessarily be identical to the circumstances of the job itself. Again, individual raters may perceive a similar situation differently. And the relative emphasis of each of the variables will shift from one occupation to another. For example, the importance of correspondence of equipment may be considerable in a machine shop program, but of only minor importance in a sales program.

A third major alternative for ascertaining job relatedness would have an individual supply his job title along with a brief job description. On the basis of this information and of a knowledge of the occupational training program, the evaluator would make a judgement as to the relatedness of the occupation to training. This scheme has much to recommend it, as it assigns to one individual (or a staff working from commonly interpreted rules) the responsibility for interpretation. In addition, it demands less interpretation and decision-making by the respondent, thereby reducing individual biases to a great degree.

But even in this case, in order to secure validity and reliability in the measurement of relatedness between any training program and any employment situation, a suitable decision model needs to be developed. One possible model is discussed in the remainder of this paper.

DIMENSIONS OF JOB RELATEDNESS

A concise description of a given job is typically contained in the job title. Consider the following two titles--Auto Mechanics, Chief; Professor of Economics. Implicit in each case are two essentially independent dimensions; one dimension (which may be thought of as horizontal) of occupational "field," as auto mechanics or economics, and another dimension (which may be thought of as vertical) of occupational "level," as chief or professor. While not all jobs set these out so straightforwardly, all occupations may, with the aid of suitable classification schemes, be located along each of the two dimensions.

Logically, these two dimensions may be combined into a two-dimensional matrix. Therefore, just as anyone's present occupation may be located on this two-dimensional matrix, so may the intended "output" of a training program be located on the matrix. Figure 1 illustrates training program YY (actually the occupation for which the graduates of program YY are expected to enter), and occupation AA. They are both in the same occupational field (B) but occupation AA is at a lower occupational "level" than is program YY.

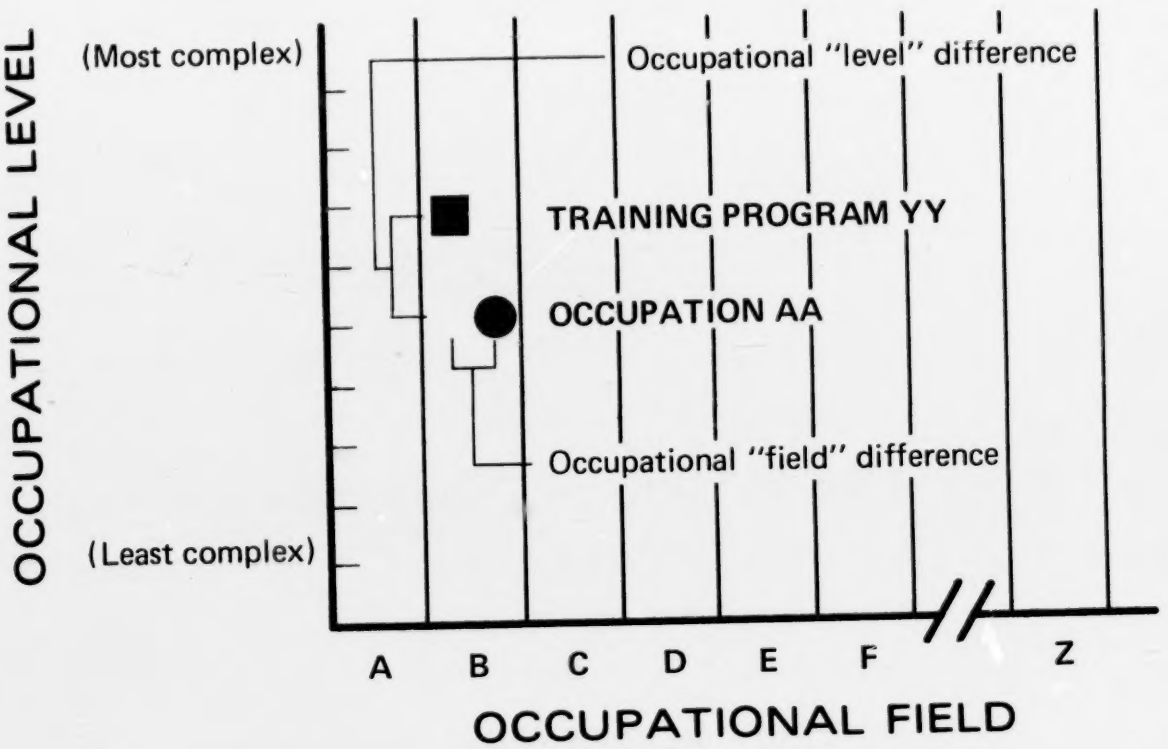

Figure 1: Locating an Occupation or Training Program in 2-Dimensional Space

Instead of locating the two occupations separately on the matrix, the difference between the occupations on each dimension of relatedness may be considered directly. Thus, any given job may be compared with another job or a training program to attain three separate measures: a) a measure of horizontal or occupational "match," b) a measure of vertical or occupational level fit, and c) combining these two measures, an overall measure of occupational relatedness. Figure 2 illustrates this idea. Note that occupation AA, with regard to training program YY, is closely matched in terms of field, but less well fitted in terms of level.

The two key factors in this job relatedness system concern a) the method of classification used to place occupations along each of the two dimensions, and b) the framework used to combine the measures to yield a single index of job relatedness. The following section considers several available occupational classification systems which might be used as bases for measuring job relatedness.

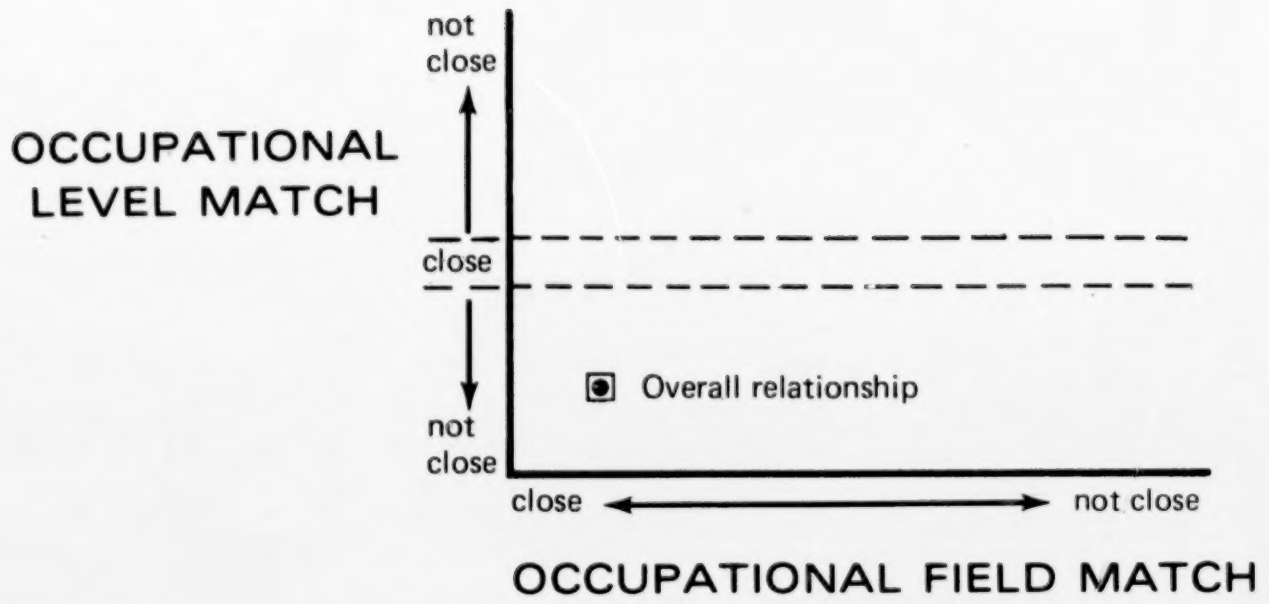

Figure 2: Relationship of Occupation AA to Training Program YY

OCCUPATIONAL CLASSIFICATION SYSTEMS

Occupational classification systems may be divided into four major groups: a) industrial, b) socioeconomic, c) worker characteristic, and d) job characteristic.[1] Each of these is considered as a possible organizer for providing a job relatedness framework.

Industrial Classification

This system considers workers within major industrial groups. Thus, both a machinist and a training director might be classified under the mining industry or under government, depending upon whom they work for. The obvious problem with this system, best typified by the Standard Industrial Classification, is that many, perhaps a majority, of occupations are not specific to a given industry.

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[1] Carroll L. Shartle. "Occupational Analysis, Worker Characteristics, and Occupational Classification Systems," Man in a World of Work (H. Borow, ed.) Boston: Houghton Mifflin Co., 1964.

Socioeconomic Classification

This hierarchical system tends to reflect stereotypes of educational levels; it places the professions at the top of the list and leaves the unskilled at the bottom. A prime example is the major classification scheme of the Dictionary of Occupational Titles (D.O.T.), particularly the earlier editions, but also true to some extent of the current third edition. Because this system is largely unrelated to the actual conditions of the employment situation, it does not provide a usefui framework for vocational program evaluation.

Worker Characteristics Classification

This method groups jobs on the basis of several characteristics of the worker thought to be necessary to carry out any given job. The kind and amount of each characteristic may be determined either by an examination of the job or by measuring the worker in the occupation. One example of this scheme is contained within the D.O.T.

D.O.T. studies (U.S. Department of Labor, 1956, p. 651) have identified five worker characteristics or "...abilities, personal traits, and individual characteristics required of a worker in order to achieve average successful job performance." The traits are (a) training time, (b) aptitudes, (c) interest, (d) temperaments, and (e) physical demands. The occupations have been arranged into 114 worker trait groups; a group consists of jobs requiring similar amounts of each trait. The groups are organized within twenty-two logically derived broad job categories, such as Art, Clerical Work, Machine Work, and Transportation.

Worker trait classification systems offer promise for other aspects of vocational program evaluation, as they allow ready comparisons between occupations. But the basis for comparison is primarily worker characteristics which is, at this time, only an indirect and somewhat crude index of job demands.

Job Content Classification

The last major classification system, that of job content organization, is the most directly applicable to the problem of measuring job relatedness. This method emphasizes the actual processes of the job: What is done on the job? What does the worker need to know in order to successfully perform this job? The difference between worker traits and job content classification systems is apparent. The former asks: What are the characteristics of a person who is successful in a given occupation? The latter asks: Given a suitable person for the occupation, what does he need to do or know in order to be successful?

The job content classification is approximated within the first three

digits of the 6-digit system of the D.O.T. In this system, "jobs are grouped according to a combination of work field, purpose, material, product, subject matter, generic term, and/or industry" (U.S. Department of Labor, 1965a, p. XVIII). The first digit, categories 0 through 9, is necessarily very broad. Each of the nine categories (0 and 1 are combined) are further divided into occupational divisions, which are identified by the second digit. There are fifteen divisions in the 0, 1 category, and the other categories have from seven to nine divisions. The third digit identifies the occupational groups, which range from two to twenty-six within each division.

To illustrate, D.O.T. number 620.281 is assigned to the occupation of AUTOMOBILE MECHANIC. The first digit, 6, identifies the broad category of Machine Trades Occupations. Adding the second digit, 62, indicates the divisional classification of Mechanics and Machinery Repairmen. Finally the third digit, 620, specifies the occupational group Motorized Vehicle and Engineering Equipment Mechanics and Repairmen. (The last three digits after the decimal point will be discussed in a later section of this report.)

There are a number of specific job titles under each occupational group. For example, the following is a partial listing of titles under classification 620.XXX.

AUTOMOBILE MECHANIC, CHIEF (auto service)
GARAGE FOREMAN (auto service)
AUTOMOBILE-REPAIR-SERVICE SALESMAN (auto service)
CARBURETOR MAN (auto service)
MECHANIC, INDUSTRIAL TRUCK (any industry)
AUTOMOBILE-RADIATOR MAN (auto service)
MOTORCYCLE TESTER (motor and bicycles)
AUTOMOBILE-MECHANIC HELPER (auto service)
BONDER, AUTOMOBILE BRAKES (auto service)

CLASSIFYING OCCUPATIONS: THE HORIZONTAL DIMENSION

Each of the jobs in an occupational group contain many identical or very similar tasks. The job content classification system therefore appears appropriate for identifying the "location" of a job with respect to another job or the intended output of a training program along the horizontal dimension of occupational field. The first three digits of the D.O.T. provide an effective means of doing this. The degree of "match" can then be quantified.

Use of the D. O. T. Code

Almost any job title has a description in Section I of the D.O.T. Thus, by matching a supplied job title and job description (as from a follow-up questionnaire) with the D.O.T. job description, any worker may be assigned a D.O.T. number. Similarly, vocational training programs may be assigned a D.O.T. number

based on the course objectives and description. Since the D.O.T. has been constructed for the purpose of grouping occupations with similar content, the numbers it assigns to different groups directly reflects the degree of content similarity among the groups. The further apart the D.O.T. numbers of two groups, the less closely matched the occupations in the two groups. Thus it is possible to use the first three digits of the D.O.T. to classify occupations as "closely matched," "somewhat matched," or "not matched" to a given training program.

"Closely Matched" Occupations

All the occupations in the same group (identical 3-digit classification) are engaged in very similar jobs. Much of the tools, work setting, general technical knowledges and specific skills are, if not interchangeable, at least highly subsitutable. Thus, anyone trained for a particular job within the occupational group might enter any job in the group and make very effective use of his training. Little loss of efficiency, for example, would appear to result if an employee trained as an AUTO MECHANIC were employed as an INDUSTRIAL TRUCK MECHANIC. In terms of occupational field, all training programs and jobs within the same D.O.T. occupational group (3-digits) may be thought of as "closely matched."

There is some trend in vocational education to prepare individuals for broader ranges of occupations within each training program. Therefore if a training program is intended to prepare persons for jobs in more than one occupational group, then the program will be "closely matched" to each of those groups, and thus to all of the specific job titles within the groups. An electronics program, for example, may be closely matched to the 003.XXX - Electrical Engineering Occupations group, with such specific job titles as ELECTRICAL or ELECTRONICS TECHNICIAN, ELECTRICAL DRAFTSMAN, RADIO ENGINEER, and INSTRUMENTATION TECHNICIAN, and to the 828.XXX group - Occupations in Fabrication, Installation, and Repair of Electrical and Electronic Products, - which includes job titles such as ELECTRONIC-SALES-AND-SERVICE TECHNICIAN and ELECTRONICS MECHANIC.

"Somewhat Matched" Occupations

Occupations entered where the prior training program is clearly useful, yet not essential, may be considered "somewhat matched." A training program which would provide a considerably better fit in terms of occupational field between job and program could be designed. In considering efficiency of vocational education, persons entering "somewhat matched" occupations are not making maximum use of their training.

Operationally, all jobs in the same D.O.T. occupation division (2 digits) may be considered "somewhat matched." Thus, all jobs, under division 81 - Welders, Flame Cutters and Related Operations would be considered "somewhat matched" to the graduate of a program designed to prepare arc welders. Occupational division 81 includes among its eight groups 810 - Arc Welders; 814 - Brazing, Braze-welding, and Soldering Occupations; and 816 - Flame Cutters and Arc Welders.

Should the objectives of the training program encompass occupational groups from more than one occupational division, then the "somewhat matched" category includes each of the relevant divisions. The previous illustration of the electronics program, for example, would count as "somewhat matched," to occupational divisions 00-01 - Occupations in Architecture and Engineering, as well as division 82 - Electrical Assembling, Installing and Repairing Occupations.

"Not Matched" Occupations

The previous two classifications, "closely matched" and "somewhat matched" will probably encompass the great majority of the jobs of employed vocational program graduates. However, a third category is necessary for jobs in which the actual skills and knowledges learned in the training program are used infrequently, if at all, in the present occupational field, and are incidental to the present job. Occupations outside of the occupational division structure are considered "not matched." For purposes of evaluation, however, there are limitations even on this category, which are discussed later under special cases.

Quantifying the Horizontal Dimension

Horizontal placement is described by the three categories, "closely matched," "somewhat matched," and "not matched." In addition, a fourth category, "unemployed," is necessary for those who are not working. A satisfactory index for the evaluation system would be devised by assigning numerical weights to each category, such as 3 for closely matched, 2 for somewhat matched, 1 for not matched, and 0 for unemployed. Weightings might vary if the vocational philosophy supports such a change.

CLASSIFYING OCCUPATIONS: THE VERTICAL DIMENSION

The second major component of a full consideration of placement of an occupation (thus enabling the comparison of two occupations or an actual job with the intended output of a training program) is the vertical dimension. Mating of trainees and training programs on this vertical scale is important. The closest possible fit between the objectives of the program and the employed graduate is the ideal for initial placement; upward vertical mobility usually is a longer-term goal, but would not necessarily be considered an immediate aim. Downward movement is likely to be regarded as undesirable whether at initial placement or later in the career line.

Use of the D. O. T. Code: The Concept of Job "Complexity"

The D.O.T. may, within limits, be used to assist in determining vertical placement. The last three digits of the 6 digit code (three digits to the

right of the decimal) contain a job requirements index. The three digits refer, respectively, to an inverse hierarchical ordering of significant relationships of the occupation to data, people and things.

A listing of the ordering, as taken from the D.O.T. (Volume 2), and arranged from the most to the least complex, is shown in Table 1. The "complexity factor" column has been added.

These three job responsibility indexes may then be used as three equal dimensions for the measure of job complexity or level, as illustrated in Figure 3. Theoretically, the more "complex" the occupation, the greater the "volume" of the occupational complexity model. The complexity factor increases for each increasing level on each of the three dimensions. The most elemental job - slight significant relationship on each of the three dimensions, is shown in Figure 3 (a). It encloses a volume of 1 (1x1x1). As a "complexity factor" of 1 corresponds with a D.O.T. code of 8, this would correspond with a D.O.T. code of XXX.888. The most complex job possible, Figure 3 (c) encloses a volume of 729 (9x9x9), and has a D.O.T. code of XXX.000. Figure 3 (b) represents an occupation high on one dimension only, with a volume of 9 (1x9x1) representing a D.O.T. code of XXX.808.

Table 1
Listing of Job Requirements Index From the D.O.T.

COMPLEXITY FACTOR	DATA (4th digit)	PEOPLE (5th digit)	THINGS (6th digit)
9	0 Synthesizing	0 Mentoring	0 Setting-up
8	1 Coordinating	1 Negotiating	1 Precision working
7	2 Analyzing	2 Instructing	2 Operating-Controlling
6	3 Compiling	3 Supervising	3 Driving-Operating
5	4 Computing	4 Diverting	4 Manipulating
4	5 Copying	5 Persuading	5 Tending
3	6 Comparing	6 Speaking-Signaling	6 Feeding-Offbearing
2	7 Slight[2]	7 Serving	7 Handling
1	8 Significant relationship	8 Slight[2] significant relationship	8 Slight[2] significant relationship

[2]The D.O.T. uses the phrase "no significant relationship." In order to use a three dimensional space enclosing figure, no dimension can be reduced to zero, thus the substitution of "slight" for "no." (7, which is also "slight (or no) significant relationship" in the data hierarchy is used instead of 8 in special combinations of codes in the D.O.T.)

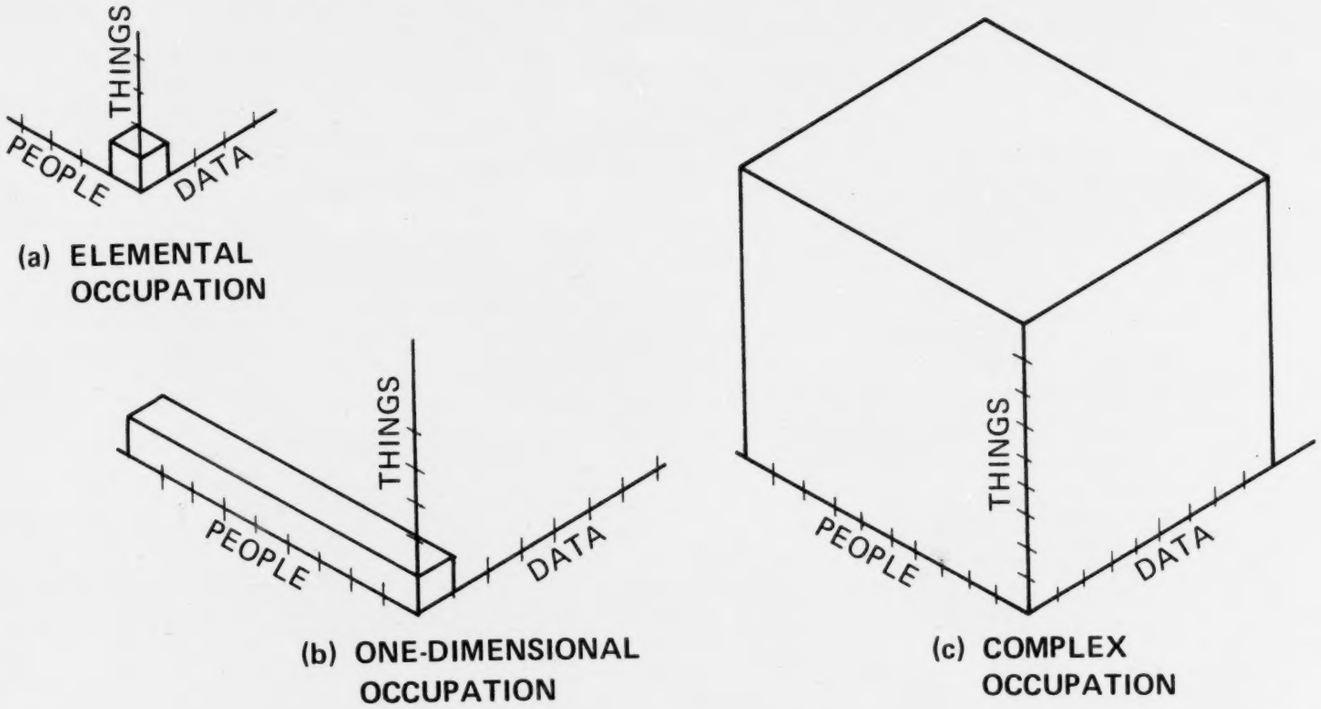

Figure 3: The Occupational "Complexity" Model

Examples Using the Complexity Coding System

Using actual D.O.T. numbers, AUTOMOBILE MECHANIC, with a code of 620.281, has a "complexity index" of 56 (7x1x8). AUTOMOBILE MECHANIC, CHIEF has a code of 620.131 and a complexity index of 384 (8x6x8). AUTOMOBILE MECHANIC HELPER, 620.884 has a complexity index of 5. ELECTRONIC TECHNICIAN, 003.181, is 64, and ELECTRONICS MECHANIC, 828.281 is 56. By inspection, suitable intervals can be determined to group occupations into five or some other number of occupational levels.

This process obviously can be modified by using different multipliers for each of the three dimensions. For instance, a more acceptable model might assign the following weights: 3 times data, 2 times people, and 1 times things.[3]

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[3]A scheme that is conceptually different, yet seems to closely mirror conventional wisdom with regard to occupational level, has been proposed (for a different purpose) by D'Costa and Winefordner (1969). The system partitions the D.O.T. code for data, people, and things into 3 levels (high, average, low, or none) and arranges them in a hierarchical order, as illustrated:

```
                                        high things
                          high people---------------average things
high data-----------------average people             low or no things
average data              low or no people
low or no data
```

A tacit assumption is an interval scale in each of the hierarchies, obviously not likely the case, but perhaps close enough to be workable. A second assumption is that the three dimensions of data, people, and things adequately circumscribe and define occupational complexity.

Quantifying the Vertical Dimension

Using this scheme in an evaluation situation, weights could be assigned the correspondence between the occupation level and the training program level. Logic would indicate that the weightings might change somewhat, depending upon the phase of the evaluation. For example, the goal of initial placement might be to match the occupation level to the level of the training program objective, and any vertical movement, either down or up, would not provide an optimal match. An upward mismatch, however, would seem less undesirable than a downward one. Therefore, on a three point scale, correspondence between the job and training program levels might be indexed as 3, a variance up as 2, and a variance down as 1.

Following initial placement, credit should likely be given to upward vertical movement, and the reverse for downward movement. Thus a year after having the training program the target occupational level could be 2, and upward levels awarded 3. Levels of less occupational complexity would be indexed as 1. Note that the scale moves up or down the occupational complexity levels index depending upon the target level, so that both technicians and machine operators, properly placed with respect to their training program, though at different absolute levels, receive the same scale index.

CLASSIFYING OCCUPATIONS: COMBINING THE TWO MEASURES

Initial Placement

The developed frameworks for combining the occupational field and level measures are presented in Figures 4 and 5. Figure 4 presents the matrix for initial placement. The 3x4 matrix represents along the base line the horizontal field position with respect to the training program. The first space is "closely matched," then "somewhat matched," "not matched," and finally, "unemployed." These are awarded the horizontal index multipliers of 3, 2, 1, and 0, respectively.

The vertical scale provides for placement of the occupation level in terms of the training program. The target level of the training program is determined, and the occupation is rated in relation to it. In initial placement, 3 is awarded for the desired close match, 2 for upward placement, 1 for down-

ward placement. Note the values in the cells; they are the product of the two scales. These cell values represent indices of the overall relatedness.

Occupational Level Placement	Closely Matched (3)	Somewhat Matched (2)	Not Matched (1)	Un-employed (0)
Upward Placement (2)	6	4	2	-
Close Match (3)	9	6	3	-
Downward Placement (1)	3	2	1	-

Occupational Field Placement

Figure 4: Job Relatedness Indices For Initial Placement

When initial placement was into the "target area," (the best possible match between training program and job) the assigned indices would be closely matched (3) times correct level (3) or 9. Incorrect level up would receive 3x2 or incorrect level down would receive 3x1. Other combinations are illustrated in Figure 4.

Subsequent Placement

Figure 5, which is the matrix for measurement subsequent to initial placement, is similar to Figure 4 except that it rewards upward mobility. Therefore, the original target level now has the scale value 2, and mobility upwards from the original level is awarded a value of 3. The values in the cells again refer to the composite score of overall relatedness.

Occupational Level Placement	Closely Matched (3)	Somewhat Matched (2)	Not Matched (1)	Un-employed (0)
Upward Placement (3)	9	6	3	-
Close Match (2)	6	4	2	-
Downward Placement (1)	3	2	1	-

Occupational Field Placement

Figure 5: Job Relatedness Indices for Subsequent Placement

A person in a somewhat matched occupation (2), who has risen in job complexity (3) would have an index of 6; this would be equal to a closely matched original target level (2) job. All unemployed individuals, having a multiplier of 0, would have zero as their relatedness score. Again, the weightings of the two indexes may be changed if supported by a congruent philosophical position.

Composite Classification of Job Relatedness

In both the initial and subsequent placement matrices, all values resulting from the product of the two scale values range from 9 to 1 (and 0). If desired, these values may be categorized into a composite classification of job relatedness, as follows: all values 9 and 6, "closely related," all values 4 and 3, "somewhat related," and all values 2 and 1, "unrelated."

PROBLEMS AND SPECIAL CASES

Certain rules and operational decisions must be made before the scheme is adequate to handle all possible occupations. These decisions again rely heavily upon, and must be compatible with, the vocational philosophy underlying the system. Following is a set of special cases and suggested solutions. Note that most of the decisions concern the occupational "field" match.

Sales Personnel

In most cases, salesmen working close to the occupational group for which they were trained should be considered "somewhat matched," as for instance used car salesmen trained as auto mechanics. Only in cases where the objectives of the training program included sales should they be considered "closely matched." The important deciding factor is the extent to which the training program reflects the most optimal training program for that given occupation.

Military Personnel

Because the majority of vocational program graduates have little control over their military assignment, it is best simply to omit these persons from the evaluation system. Their military duties count neither for nor against the program from which they graduated. They may be "picked up" upon separation from military service. Theoretically, all who stay in the military beyond their period of obligation should be followed-up to determine the degree of relatedness of their responsibilities to their training program. However, difficulties in follow-up may make this impractical.

Students

Those who choose to pursue education in lieu of regular employment present a special problem. Unlike most military personnel, they have chosen their course, but it would seem best to wait until their career goals are reasonably clear by actual entry to the full-time labor force before making a judgement about the relatedness of their occupation to their original training program. In all probability, only occasionally will the occupation they eventually enter be considered "closely matched." An electronics technician graduate who later enters a four-year college and becomes an electrical engineer does not represent the most optimal training pattern possible; yet his training is likely to be very useful. The match would likely rate as "somewhat matched." The question underlying the decision is: What was the intent of the original training program?

Ill and Handicapped Persons

Those who become seriously ill and/or physically or mentally incapable of performance on a job after acceptance into the training program should be removed from the evaluation system, counting neither for nor against the program. However, similar persons who were readily diagnosable before the program began, but were nevertheless admitted, represent program failures and should be counted as regular unemployed.

Unemployed

Those who are not actively engaged in a socially useful enterprise should be considered unemployed. Whether they are seeking work or not is irrelevant. Similarily, whether or not they are "gainfully" employed in a wage-earning occupation is not a useful criterion; a penniless, non-income producing artist or writer may be much more "employed" than a golf-playing executive or feather-bedding railroad fireman. Obviously, decisions may become difficult here, especially on the basis of sketchy questionnaire data. If in serious doubt, it would be better to exclude an individual from the evaluation than to err either way, particularly when a mental set is likely to cause a systematic error.

Housewives

Housewives obviously fulfill a useful and socially necessary role. They are, in fact, in a full time occupation which may be judged on its content as "closely," "somewhat," or "not matched" to their previous training program. In most cases, housewives will likely be "not matched" to the given training program. Thus, if it is determined that a housewife would normally make only occasional use of her training, as would be true of the programs of practical

nursing or tailoring, the occupation would (consistent with the entire decision model) count as "not matched." In passing, it is important to underline that housewives should be considered to be employed in a full-time occupation.

Part-time and Extra-time Workers

Presumably, persons are trained on the assumption that they will work full time, e.g. about 35-40 hours per week. Those who work less return less to society, on the average, and those who work more return more. Therefore, an optional penalty-bonus system may be included in the relatedness system. Each multiple of 15 hours per week worked may be counted as one third of the normal work load, so that 1-15 hours worked per week equals one-third, 16-30 hours equals two-thirds, and 31-45 hours equals 100 per cent. In the same manner, overtime (more than 45 hours) would equal a one-third "bonus." These figures would then increase or decrease the individual's relatedness score by a corresponding amount. It follows that two different part-time jobs, or a "moonlight" job, can be handled by calculating the relatedness scores on each job separately and adding the two scores together for the person's total "contribution."

Occupations Unassigned in the D.O.T.

Judgements must be made regarding occupations not assigned code numbers. Use of the D.O.T. with similar occupations will provide help in assigning numbers. U.S. Employment Service personnel may be contacted for assistance, but in most cases, a thorough knowledge of the D.O.T. classification system and of the training programs and occupations in question will allow a satisfactory classification to be made.

SUMMARY

If all vocational program graduates went into and remained in exactly the occupational area trained for, and at the appropriate level, vocational program evaluation would be much simplified. However, persons enter many different kinds of jobs and it is necessary to have a reliable criterion measurement scheme in order to evaluate one program against its objectives, or to compare two or more programs.

This paper suggests that a job (or the intended employment preparation of a training program) may be considered to be adequately measured by two dimensions, a horizontal one of occupational field, and a vertical one of occupational level. It is then possible to compare occupations in terms of these two dimensions. These relationships may be quantified and combined to produce an overall index of the relationship between two jobs, or between a given job and a training program.

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1. Stimulate, facilitate and coordinate innovative research and development efforts.

2. Disseminate research-related information to assist research and development efforts and to speed the implementation of worthy educational innovations.

3. Increase the number and improve the competence of producers and consumers of vocational research-related materials.

4. Create knowledge and useful products that have potential for making long-range and general qualitative improvements in vocational education.